

WHAT IS CLAIMED IS:

1. A method for determining a paging alert mode of a mobile terminal in a mobile communication system, comprising the steps of:

5 determining whether there exists a sub-BTS (Base Transceiver System), based on a broadcasting channel message provided from a main BTS;

receiving a beacon paging group frame from the sub-BTS, when the sub-BTS exists; and

10 upon receipt of the beacon paging group frame, changing the paging alert mode to a predetermined paging alert mode.

2. The method as claimed in claim 1, where in the sub-BTS exists in a main cell being serviced by the main BTS.

15 3. The method as claimed in claim 2, wherein the broadcasting channel message is simultaneously transmitted to every mobile terminal located in the main cell by the main BTS.

20 4. The method as claimed in claim 1, wherein the paging alert mode changing step comprises the steps of:

upon receipt of the beacon paging group frame, determining that the mobile terminal is located in a sub-cell formed by the sub-BTS, and changing the paging alert mode to a silent paging alert mode; and

25 upon failure to receive the beacon paging group frame, determining that the mobile terminal is not located in the sub-cell, and changing the paging alert mode to a paging alert mode set by a subscriber.

5. The method as claimed in claim 4, wherein the silent paging alert mode is a vibration mode.

6. The method as claimed in claim 4, wherein the silent paging alert mode is a display mode.

7. The method as claimed in claim 4, wherein the beacon paging group frame is provided through a physical channel of the sub-cell.

8. A method for determining a paging alert mode of a mobile terminal in a mobile communication system, comprising the steps of:

receiving a broadcasting channel message;

analyzing sub-cell information and a beacon paging period from the broadcasting channel message;

determining whether a main cell formed by a main BTS includes a sub-cell, depending on the analysis result;

receiving, when the sub-cell exists, a beacon paging group frame provided from a sub-BTS of the sub-cell synchronized with the main cell in the beacon paging period;

upon receipt of the beacon paging group frame, setting the paging alert mode of the mobile terminal to a silent paging alert mode;

upon failure to receive the beacon paging group frame, setting the paging alert mode of the mobile terminal to a paging alert mode designated by a user;

determining a paging group using an ID of the mobile terminal and the number of the paging group frames in a PICH provided from the main BTS through a physical channel;

accessing a paging group frame corresponding to the determined paging group out of the paging group frames in the PICH received from the main BTS in sync with the

beacon paging group frame; and analyzing the accessed paging group frame, and upon detecting a paging request, indicating receipt of an incoming call by the set paging alert mode.

5 9. The method as claimed in claim 8, wherein the broadcasting channel message is simultaneously transmitted to every mobile terminal located in the main cell by the main BTS.

10 10. The method as claimed in claim 8, the silent paging alert mode is a vibration mode.

15 11. The method as claimed in claim 8, wherein the silent paging alert mode is a display mode.

20 12. The method as claimed in claim 8, wherein the beacon paging group frame is provided through a physical channel of the sub-cell.

 13. The method as claimed in claim 8, wherein the number of the paging groups in the PICH provided through the physical channel of the main cell is determined according to whether the sub-cell exists .

 14. A method for determining a paging alert mode in a mobile communication system, comprising the steps of:

25 inserting sub-cell information for a sub-cell and a beacon paging period in a broadcasting channel message of a main BTS and transmitting the broadcasting channel message, when the sub-cell exists in a main cell formed by the main BTS;

 upon receipt of a paging request from a core network, transmitting, in a radio

network controller, paging request information with a paging group frame to which a paging-requested mobile terminal belongs, out of paging group frames in a PICH ; and

transmitting, in a sub-BTS for forming the sub-cell, a beacon paging group frame in sync with the paging group frames, the beacon paging frame group requesting a change of the paging alert mode.

15. The method as claimed in claim 14, wherein the broadcasting channel message transmitting step comprises the steps of:

determining whether there exists the sub-BTS for forming the sub-cell in the main cell formed by the main BTS;

designating, in the main BTS, a beacon paging group frame for the sub-cell, when the sub-BTS exists;

determining a beacon paging period at which the beacon paging group frame is to be transmitted;

generating a broadcasting channel message including the sub-cell information with an ID designating the beacon paging group frame and the determined beacon paging period; and

transmitting the generated broadcasting channel message to every mobile terminal located in the main cell through a broadcasting channel.

16. The method as claimed in claim 14, wherein the paging request information transmitting step comprises the steps of:

monitoring a paging request from the core network;

upon receipt of the paging request, determining whether there exists the sub-BTS;

determining, when the sub-BTS exists, a paging group depending on the number of the paging group frames in the PICH excepting the designated beacon paging group

frame and an ID of the mobile terminal to be paged;

determining, when the sub-BTS does not exist, a paging group depending on the number of the paging group frames in the PICH and the ID of the mobile terminal to be paged; and

5 transmitting paging request information with the paging group frame corresponding to the determined paging group through a physical channel.

17. The method as claimed in claim 14, wherein the beacon paging group frame transmitting step comprises the steps of:

10 detecting an interrupt provided from the radio network controller at a transmission time point of the beacon paging group frame; and

upon detecting the interrupt, transmitting, in the sub-BTS, a beacon paging group frame in which all bit values for requesting a change of the paging alert mode are '1', through the physical channel.

15 18. The method as claimed in claim 17, wherein the beacon paging period is determined as a multiple of a period of the PICH .

19. An apparatus for determining a paging alert mode in a mobile communication system, comprising:

20 a main BTS for forming a main cell, and inserting, when there exists a sub-cell in the main cell, sub-cell information for the sub-cell and a beacon paging period in a broadcasting channel message before transmission;

25 a radio network controller for transmitting paging request information with the paging group frame to which a paging-requested mobile terminal belongs, out of the paging group frames in the PICH;

a sub-BTS for forming the sub-cell, and transmitting a beacon paging group

frame requesting a change of the paging alert mode in response to an interrupt from the radio network controller; and

a mobile terminal for setting the paging alert mode according to whether the beacon paging group frame is accessed, and performing the set paging alert mode when
5 paging is detected by accessing the paging group frame.

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